



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

MEMORANDUM

DATE: September 15, 2021

SUBJECT: Efficacy Review for Copper Armor (Eggshell),
EPA Reg. No. 56601-U
Action Code Case: 00216529
E-submission No. 59807

FROM: Nicole Karikari
Efficacy Branch
Antimicrobials Division (7510P)
Date Signed: September 15, 2021

Nicole Karikari

THRU: Tajah Blackburn
Efficacy Branch
Antimicrobials Division (7510P)
Date Signed: September 15, 2021

Tajah Blackburn

Thao Pham
Efficacy Branch
Antimicrobials Division (7510P)
Date Signed: September 15, 2021

Thao Pham

TO: Eric Miederhoff, PM 31/ Joseph Daniels
Regulatory Management Branch I
Antimicrobials Division (7510P)

APPLICANT: PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272

Formulation from the Label:

<u>Active Ingredient(s)</u>	<u>% by wt.</u>
Cuprous Oxide	0.30%
<u>Other Ingredients</u>	99.7%
Total	100.0%

I BACKGROUND

Product Description (as packaged, as applied): Architectural coating/ paint

Submission type: New Registration

Currently registered efficacy claim(s): N/A

Requested action(s): Applicant is submitting data to support the registration of an antimicrobial architectural coating (i.e., walls, other painted surfaces) with multi-year supplemental antimicrobial residual efficacy claims against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella aerogenes*, MRSA, *Escherichia coli*, *Salmonella enterica*, Feline calicivirus, and SARS-CoV-2.

Documents considered in this review:

- Cover letter from applicant to EPA dated 1/29/2021
- Proposed label – No date provided; reviewed version attached.
- Data Matrix (EPA Form 8570-35) dated 1/29/2021
- Correspondence from the Applicant to the Agency dated 5/14/2021 (provides batch sheets and test reports amended to include control results)
- Correspondence from the Applicant to the Agency dated 6/25/2021 (provides revised CSF, additional information on an inert ingredient, and revised master label)
- Correspondence from the Applicant to the Agency dated 7/14/2021 (provides post-test chemical analyses of the test samples)
- Application summary and administrative materials
 - MRID 51433501 dated 1/29/2021
- Eight efficacy studies
 - MRID 51433505
 - MRID 51433506
 - MRID 51433507
 - MRID 51433508
 - MRID 51433509
 - MRID 51433510
 - MRID 51433511
 - MRID 51433512
- Confidential Statement of Formula (EPA Form 8670-4)
 - Basic Formulation dated 6/16/2021
- EPA Supplemental Report dated 9/4/2021 (provides soil load, dates of testing, and temperature and humidity details for the efficacy studies above)

II PROPOSED DIRECTIONS FOR USE

“DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. This product is not intended for food uses or food contact surfaces.

If cleaning is needed, bleach based or peroxide based cleaners are recommended to maintain the antiviral and antibacterial performance of the paint.

Using quaternary ammonium based cleaners to clean the painted surface can reduce the antiviral and antibacterial effectiveness of the coating.

WHERE TO USE: Ideal for use on properly prepared, interior walls, ceilings, or trim composed of new or previously painted drywall, plaster, masonry, wood, and metal.

COVERAGE: Approximately 300 to 400 sq. ft. (28 to 37 sq. meters) per U.S. gallon (3.78 L) on primed, smooth, nonporous surfaces. Coverage figures do not include material loss due to surface irregularities and porosity, or material loss due to application method or mixing. Some colors, drastic color changes, or porous surfaces may require additional coats to achieve a uniform finish.

SURFACE PREPARATION: Surface must be clean and dry. Remove all loose, peeling paint, dirt, grease, and any other surface contaminants. Putty all nail holes and caulk all cracks and open seams. Sand all glossy, rough, and patched surfaces. Plaster, concrete, and masonry surfaces must be completely dry, free of efflorescence, and allowed to cure for 30 days prior to painting. When applied to an uncoated substrate or to bare wood, two coats are required with the first coat acting as the primer. Uncoated substrates, repaired surfaces, or lightly stained areas may require additional coats. For severe stains, water marks, and other challenging conditions, such as bare metal or chalky surfaces, use an appropriate specialty primer.

WARNING! If you scrape, sand, or remove old paint, you may release lead dust or fumes. LEAD IS TOXIC. EXPOSURE TO LEAD DUST OR FUMES CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a properly fitted, NIOSH-approved respirator and prevent skin contact to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the US EPA. National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead. Follow these instructions to control exposure to other hazardous substances that may be released during surface preparation.

APPLICATION: Stir thoroughly. Apply with a high-quality brush, roller (nap size – 3/8" for smooth surfaces and up to 3/4" for rough or textured surfaces), paint pad, or by spray equipment. For airless spray application, use tip size .015" to .021" and pressure range of 1500 to 2000 psi. When using more than one container of the same color, intermix to ensure color uniformity. Do not thin. Apply only when air, product, and surface temperatures are between 50°F (10°C) and 90°F (32°C).

DRYING: Normally dries to touch in 30 to 60 minutes at 77°F (25°C) and 50% relative humidity. Allow two to four hours before recoating. Drying times listed may vary depending on temperature, humidity, color, film build, and air movement. Wait at least 30 days after painting before cleaning the surface with a non-abrasive, mild cleanser. Very deep colors may require longer to fully cure.

III AGENCY STANDARDS

Interim Guidance – Review for Products Adding Residual Efficacy Claims

(<https://www.epa.gov/pesticide-registration/interim-guidance-review-products-adding-residual-efficacy-claims>) - Last modified: April 28, 2021)

Supplemental Residual Antimicrobial Products

III. Qualifying antimicrobial surface coatings, films, fixed/solid and paint products should demonstrate efficacy against vegetative bacteria first before virus claims can be supported. These products are not required to meet the efficacy standards for disinfectants and can only be approved for use as supplements to standard disinfection. The duration of residual effectiveness claims that EPA will consider for review depends on the type of product as detailed below.

A. Antimicrobial Surface Coatings and Films

Utilize EPA's draft [Performance of Antimicrobial Surface Coatings on Hard Non-porous Surfaces](#) for qualifying bacteria. Additional information is provided below for addition of virus claims.

Test Organisms

Bacteria—*Staphylococcus aureus* (ATCC No. 6538) and *Pseudomonas aeruginosa* (ATCC No. 15442) are the qualifying bacteria required to support supplemental residual antimicrobial surface claims for the proposed claim duration (e.g., 1 week, 2 weeks, etc.)

Testing should be conducted on 3 product lots per bacterium at the LCL.

To support claims for additional bacteria, testing should be conducted according to the method but with a reduced number of product lots.

2 lots of product for each bacterium at the nominal concentration.

Viruses—All viruses for which claims are desired should be tested. The most difficult to kill virus should be subjected to the durability assessment using coating carriers followed by the efficacy assessment to support the proposed duration (e.g., 1 week, 2 weeks, etc.). All other viruses should be tested using coated carriers that were not subjected to the durability procedure.

Assessment of virucidal efficacy on the coated carriers should be conducted consistent with ASTM E1053, the standard method specified in [EPA's 810.2200 Efficacy Test Guideline](#).

Two lots of product at the LCL should be tested for the most difficult to kill virus. Two lots of product at the nominal concentration should be tested for additional viruses.

Note that to be considered as a supplement to List N, virus testing should include a non-enveloped virus or a human coronavirus (SARS-CoV-2 or human coronavirus 229E).

Stainless steel carriers will be used to support claims for coatings on hard, nonporous surface. Use sites should be limited to hard, non-porous surfaces. Additional material types (e.g., porous materials or textiles) may be proposed by the registrant upon consultation with EPA prior to submission.

The recommended number of abrasions (touches) and cycles of exposure to cleaning or disinfecting chemicals are provided in the method in order to substantiate durability claims. The method also specifies the chemical disinfecting solutions to simulate cycles of in-service disinfection and cleaning. Additional details can be found in the method.

10 cycles of abrasion/chemical exposure = 1 week of durability. The number of cycles can be increased in 1 week increments to support claims up to 4-weeks.

If a product is incompatible with one or more of the test chemistries, this should be discussed with EPA in advance and may limit use sites and surfaces depending on the nature of the incompatibility. EPA does not have a standard method for determining incompatibility. This may be based on research and development data or known incompatibilities with the coating material for example.

This protocol can be modified for films upon consultation with EPA in advance of submission.

If you intend to claim supplemental residual effects longer than 4-weeks, consult with EPA in advance of submission. Because the on-going antimicrobial integrity of coatings and films will not be readily visible, it is important that end users have a reasonable expectation of durability.

Products should achieve a 99.9% reduction (3-log) for both bacteria and virus/es in comparison to untreated controls within a maximum of 2-hours but not less than 1-hour, as EPA is concerned that observations taken before the inoculum has dried (e.g., less than 1 hour) on the surface may not provide an accurate assessment of the product.

The time to achieve performance begins at the time of inoculation.

B. Antimicrobial Surface Coatings and Films - Labeling and Additional Information

This new category of antimicrobial products should be labeled as supplemental residual antimicrobial surfaces.

As these products do not meet the criteria for a disinfectant due to the longer contact time and lower performance standard, claims for residual disinfectant are not acceptable. As above, contact times for disinfectants are ≤ 10 minutes and with a higher performance standard for bacteria.

Products should carry the following prominent label qualifier that they are a supplement to standard disinfection and cleaning:

“Although this product DOES NOT meet EPA’s standards for disinfectants, EPA has determined that, when used with an EPA-registered disinfectant, this product can provide some additional protection against [microorganism(s)] for up to X days. This product DOES NOT achieve the same level of efficacy as an EPA-registered disinfectant; it is only intended to provide supplemental protection between routine applications of EPA-registered disinfectants.”

For products eligible only for supplemental residual antimicrobial claims, EPA intends to require as a term of registration that the label and labelling state “This product does not meet EPA’s efficacy standards to qualify as a stand-alone disinfectant”.

Although these products will not be eligible for List N, they will be eligible as a supplement to List N (N.1) to reflect that they are supplemental treatments (i.e., not stand-alone disinfectants) and intended for use in combination with List N disinfectants.

The following are example acceptable product label claims:

“Kills 99.9% of [insert microorganism/s] within 2 hours of exposure when used as part of a comprehensive infection control program/protocol for up to X days.”

“Continuously reduces [insert microorganism/s] within 2 hours of exposure when used as part of a comprehensive infection control program for up to X days.”

C. Fixed/Solid Surfaces Including Solid Copper and Other Metals and Solid Impregnated Materials and Paints- Method Recommendation

Utilize EPA's [Draft Copper Surface Protocol](#) for qualifying bacteria. Additional information is provided below for addition of virus claims.

Test Organisms

Bacteria—*Staphylococcus aureus* (ATCC No. 6538) and *Pseudomonas aeruginosa* (ATCC No. 15442) are the qualifying bacteria used to support supplemental residual surface claims.

Testing should be conducted on 3 product lots per bacterium at the LCL.

To support claims for additional bacteria, testing should be conducted according to the method but with a reduced number of product lots.

2 lots of product for each bacterium at the nominal concentration.

Viruses—All viruses for which claims are desired should be tested. The most difficult to kill virus should be subjected to the durability assessment in the copper method followed by the efficacy assessment. All other viruses should be tested using test carriers that were not subjected to the durability procedure.

Assessment of virucidal efficacy on the coated carriers should be conducted consistent with ASTM E1053, the standard method specified in [EPA's 810.2200 Efficacy Test Guideline](#)

Two lots of product at the LCL should be tested for the most difficult to kill virus. Two lots of product at the nominal concentration should be tested for additional viruses.

The recommended number of abrasions (touches) and cycles of exposure to cleaning or disinfecting chemicals are provided in the method in order to substantiate durability claims. The method also specifies the chemical solutions to simulate cycles of disinfection and cleaning.

As the durability of these types of product can be readily observed, duration claims are not necessary. This is consistent with currently registered copper-containing surface products and paints.

If a product is incompatible with one or more of the test chemistries, this should be discussed with EPA in advance and may limit use sites and surfaces depending on the nature of the incompatibility. EPA does not have a standard method for determining incompatibility. This may be based on research and development data or known incompatibilities with the coating material for example.

This protocol can be modified for other metals or solid impregnated surfaces or paints upon consultation with EPA.

Products should achieve a 99.9% reduction (3-log) for both bacteria and virus/es in comparison to untreated controls within 2-hours.

The time to achieve performance begins at the time of inoculation.

D. Fixed/Solid Surfaces Including Solid Copper and Other Metals and Solid Impregnated Materials and Paints- Labeling and additional information

These products should be labeled as supplemental residual antimicrobial surfaces.

As these products do not meet the criteria for a disinfectant due to the longer contact time and lower performance standard, claims for residual disinfectant are not acceptable.

Products should carry the following prominent label qualifier that they are a supplement to standard disinfection and cleaning:

“Although this product DOES NOT meet EPA’s standards for disinfectants, EPA has determined that, when used with an EPA-registered disinfectant, this product can provide some additional protection against [microorganism(s)] for up to X days. This product DOES NOT achieve the same level of efficacy as an EPA-registered disinfectant; it is only intended to provide supplemental protection between routine applications of EPA-registered disinfectants.”

For products eligible only for supplemental residual antimicrobial claims, EPA intends to require as a term of registration that the label and labelling should state “This product does not meet EPA’s efficacy standards to qualify as a stand-alone disinfectant”.

Although these products will not be eligible for List N, they will be eligible as a supplement to List N (N.1) to reflect that they are supplemental treatments (i.e., not stand-alone disinfectants) and intended for use in combination with List N disinfectants. The following are example acceptable product label claims:

“Kills 99.9% of [insert microorganism/s] within 2 hours of exposure when used as part of a comprehensive infection control program/protocol”

“Continuously reduces [insert microorganism/s] within 2 hours of exposure when used as part of a comprehensive infection control program”

E. Supplemental Residual Antimicrobial Products - Stewardship Program

EPA intends to require, as a term of registration, that registrants of all supplemental residual antimicrobial products prepare and implement a written stewardship plan designed to support the responsible use of supplemental residual coatings and antimicrobial surface products. Unlike the conventional antimicrobial products, these products represent unique challenges that require timely feedback to ensure proper use and compatibility in combination with current infection control practices. EPA expects that plans would be submitted for EPA review and approval during the registration process, or shortly thereafter (e.g., within two months after the registration date). An approvable plan would address the proper sale (including advertising and promotional materials), distribution, and responsible use of the supplemental residual coatings and antimicrobial surface products. Plans should include, at a minimum, the following elements:

Advertising and promotional materials that clearly and consistently include a disclaimer that the product does not meet EPA’s standards for disinfectants and is intended to supplement the use of EPA-registered disinfectants.

Outreach to the infection control community;

Customer feedback consisting of product issues/concerns, adverse events, compliance challenges/observations, and contraindications/adverse events gathered through quarterly registrant-initiated surveys, customer complaints, and suggestion boards; and

Development of a stewardship website

If EPA determines at any time following registration that the Plan is not being adequately or timely implemented or does not effectively ensure the product's safe and effective use, the registration may be cancelled by the Agency.

IV STUDY SUMMARIES

Post-Test Chemical Analyses of Test Samples:

Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. As a one-time provision, EPA will consider post-test chemical analysis results for the concentrations of the AIs for each test lot. Note, that this the only time the Agency will extend this provision, and for any future data submissions, the Agency will only accept the chemical analysis of test lots performed prior to the initiation of testing.

Proposed Confidential Statement of Formula (EPA Form 8670-4) – Basic Formulation dated 6/16/2021

Active Ingredient	Corning® Antimicrobial Particles Cupric Oxide (CASRN 1317-38-0) (33% active)
Nominal (Actual Percent by weight)	0.33
Lower Certified Limit (Actual Percent by weight)	0.30
Acceptable Level (Based on EPA Standard Certified Limits)	0.30294

Lot 1. Date of chemical analysis: 7/1/2021

ID Code	Tint and Treatment	CuO (wt%) Based on Corning CoA	Post-test CuO (wt%)	Post-test analysis at LCL
CP-8040	Untinted with Copper	0.32	0.31	No
CP-8042	PPG Raw Umber (Tint A) with Copper	0.31	0.28	Yes
CP-8044	PPG Formula Pro Durable Red (Tint B) with Copper	0.31	0.30	Yes
CP-8046	PPG Formula Pro Black (Tint C) with Copper	0.31	0.30	Yes
CP-8048	BASF Raw Umber (Tint D) with Copper	0.31	0.29	Yes
CP-8050	Sherwin Williams Black (Tint E) with Copper	0.31	0.30	Yes
CP-8052	PPG Futurity Durable Red (Tint F) with Copper	0.31	0.31	No

Lot 2. Date of chemical analysis: 7/1/2021

ID Code	Tint	CuO (wt%) Based on Corning CoA	Post-test CuO (wt%)	Post-test analysis at LCL
CP-8041	Untinted with Copper	0.32	0.28	Yes
CP-8043	PPG Raw Umber (Tint A) with Copper	0.31	0.29	Yes
CP-8045	PPG Formula Pro Durable Red (Tint B) with Copper	0.31	0.31	No
CP-8047	PPG Formula Pro Black (Tint C) with Copper	0.31	0.33	No
CP-8049	BASF Raw Umber (Tint D) with Copper	0.31	0.31	No
CP-8051	Sherwin Williams Black (Tint E) with Copper	0.31	0.29	Yes
CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0.31	0.31	No
CP-8081_2	Untinted with Copper	0.32	0.28	Yes
CP-8083_2	PPG Raw Umber (Tint A) with Copper	0.31	0.26	Yes
CP-8120	Untinted with Copper	0.32	0.32	No
CP-8122	PPG Formula Pro Red Oxide with Copper	0.30	0.26	Yes
CP-8126	BASF Red Oxide with Copper	0.30	0.32	Yes
CP-8135†	Untinted with Copper	0.32	Not provided	N/A
CP-8139†	PPG Futurity Durable Red (Tint F) with Copper	0.30	Not provided	N/A
CP-8122†	PPG Formula Pro Iron Oxide with Copper	0.30	0.32	No

Basic CSF dated 6/16/2021 indicates that the Lower Certified Limit (LCL) of the subject product as 0.30% (Acceptable level = 0.30294%).

Abrasion and Exposure to Chemical Solutions Treatments:

MRID 51433501 indicated the following: *“The wear and cleaning protocol was conducted by PPG at its Cheswick, PA facility and the full protocol is contained in Appendix A []. Briefly, wear testing was conducted using EPA’s suggested equipment, the Gardco Model D10V abrasion tester using the WA-2220 sponge box and WA-2323 1000g weight. Prior to abrasion and chemical compatibility testing, paint films are coated using a draw down method onto Leneta scrub charts and allowed to cure/dry for 7 days prior to abrasion testing. Sponges were soaked in the indicated cleaning solution, excess cleaner was squeezed out, the sponge was loaded into the sponge box, and the weight added. [A single] wear cycle consisted of 4 passes of the sponge across the panel and is intended to replicate 1 month of typical cleaning in real world situations. After the cycle, the paint sample is removed and allowed to air dry for at least 10 minutes prior to the next wear cycle. A new sponge was used for each wear cycle, and 60 total cycles were conducted which is intended to approximate 60 months or 5 years of typical cleaning and wear.”*

In addition, per an email from the registrant to the Agency dated 9/15/2021:

“This email responds to the Agency’s request for the dates on which PPG conducted the wear testing and additional information on the cleaners used. Below is a table which contains the days of wear testing, sorted by CP code (internal numbering system). This number corresponds with the CP codes in the submission. When compiling this data, we noticed a “mismatch” between the dates listed for CP 8030 and CP 8044 given here (9/29/2020-10/1/2020, the wear test date) and in the most recent request which was a report from Siva labs giving the date of efficacy testing as 10/28/2020 (efficacy test date). This is beyond the time frame stipulated in the agreed upon protocol of no more than 7 days between conclusion of the wear testing and initiation of efficacy testing. However, we have confirmed with Siva that the most recently submitted test report contained a typo for the dates, and should indicate that CP 8030 and CP 8044 were tested on 10/06/2020. Siva is preparing an amended report that we are happy to submit to EPA on request.

Product code	w or w/o Cu	Cleaner	wear test date (bacteria testing)	wear test date (FCV testing)
CP-8026	no copper	Clorox	9/24/2020	9/24/2020
CP-8026	no copper	Virex	9/24/2020	9/24/2020
CP-8026	no copper	peroxide	9/24/2020	9/24/2020
CP-8040	with copper	Clorox	9/24/2020	9/24/2020
CP-8040	with copper	Virex	9/24/2020	9/24/2020
CP-8040	with copper	peroxide	9/24/2020	9/24/2020
CP-8028	no copper	Clorox	9/24/2020	9/24/2020
CP-8028	no copper	Virex	9/24/2020	9/24/2020
CP-8028	no copper	peroxide	9/24/2020	9/24/2020
CP-8042	with copper	Clorox	9/24/2020	9/24/2020
CP-8042	with copper	Virex	9/24/2020	9/24/2020
CP-8042	with copper	peroxide	9/24/2020	9/24/2020
CP-8030	no copper	Clorox	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8030	no copper	Virex	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8030	no copper	peroxide	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8044	with copper	Clorox	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8044	with copper	Virex	9/29 - 10/1/2020	9/29 - 10/1/2020

CP-8044	with copper	peroxide	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8032	no copper	Clorox	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8032	no copper	Virex	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8032	no copper	peroxide	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8046	with copper	Clorox	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8046	with copper	Virex	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8046	with copper	peroxide	9/29 - 10/1/2020	9/29 - 10/1/2020
CP-8034	no copper	Clorox	10/5/2020	10/5/2020
CP-8034	no copper	Virex	10/5/2020	10/5/2020
CP-8034	no copper	peroxide	10/5/2020	10/5/2020
CP-8048	with copper	Clorox	10/5/2020	10/5/2020
CP-8048	with copper	Virex	10/5/2020	10/5/2020
CP-8048	with copper	peroxide	10/5/2020	10/5/2020
CP-8036	no copper	Clorox	10/5/2020	10/5/2020
CP-8036	no copper	Virex	10/5/2020	10/5/2020
CP-8036	no copper	peroxide	10/5/2020	10/5/2020
CP-8050	with copper	Clorox	10/5/2020	10/5/2020
CP-8050	with copper	Virex	10/5/2020	10/5/2020
CP-8050	with copper	peroxide	10/5/2020	10/5/2020
CP-8038	no copper	Clorox	10/8/2020	10/8/2020
CP-8038	no copper	Virex	10/8/2020	10/8/2020
CP-8038	no copper	peroxide	10/8/2020	10/8/2020
CP-8052	with copper	Clorox	10/8/2020	10/8/2020
CP-8052	with copper	Virex	10/8/2020	10/8/2020
CP-8052	with copper	peroxide	10/8/2020	10/8/2020

The request[ed] information on the cleaners used is:

- Virex TB-EPA registration number 70627-2 (used as is)
0.105% n-alkyl (68% C₁₂, 32% C₁₄) dimethyl ethylbenzyl ammonium chlorides
0.105% n-alkyl (60% C₁₄, 30% C₁₆, 5% C₁₂, 5% C₁₈) dimethyl benzyl ammonium chlorides
- Clorox- EPA registration number 67619-32
8.25% sodium hypochlorite, diluted to 4.4% as described in the submission.
- Hydrogen peroxide-NDC 0869-0871-45. Swan brand (used as is)
3% hydrogen peroxide"

1.	MRID	51433505	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Bacterial	
Testing Lab; Lab Study ID		Siva Microbiological Solutions, LLC; Final Report No 2021-013b	
Experimental Start Date		Lot 1: 9/26/2020 Lot 2: 9/19/2020	Study Completion Date: 1/22/2021
Test organism(s) <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		Staphylococcus aureus (ATCC 6348) Pseudomonas aeruginosa (ATCC 15442)	
Test Method		Protocol for the Evaluation of Bactericidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141401; EPA Memorandum 89661-2_DP457456	
Application Method		Coat carrier surface	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% FBS + 1% Triton X-100	
Carrier type, # per lot		1 x 1 square inch coupon from the painted scrub test panels;	
Test conditions		Contact time: 2 hours Temperature: 17.3-23.4°C (range due to different test dates) Relative humidity: 33.3-56% (range due to different test dates)	
Neutralizer		Lethen Broth	
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		Notes: <ul style="list-style-type: none"> • Amended Final Report No. 2021-013b included in "Cover Letter Response to EPA 75 Deficiency Letter" dated May 14, 2021 • Non-GLP Study – Per the GLP Statement on page 5 of the study report, the study was conducted in compliance with U.S. Environmental Protection Agency Good Laboratory Practice (GLP) regulations set forth in 40 CFR Part 160 with the exception of: Part 160.35 (a)- Testing facility will have a QA unit responsible for monitoring each study to 	

	<p>assure management that facilities, equipment, personnel, methods, practices, records and controls are in conformance with the regulations.</p> <ul style="list-style-type: none"> • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>Protocol Deviations:</p> <ol style="list-style-type: none"> 1. "Paint Lot #1: Coated untreated and treated coupons underwent exposures to three cleaners [with prescribed wash cycles]. We included in the study the blank uncoated scrub charts as recommended in the method, for recording the recoveries for the two bacteria, <i>Pseudomonas aeruginosa</i> ATCC 15442 and <i>Staphylococcus aureus</i> ATCC 6538. As per method, a 20 µL inoculum was spread on the blank chart [Figure 1]. After 2 hrs. of drying at ambient temperature, similar to untreated and treated coated charts, the coupons were processed for their recovery. Overall, it was observed that all blank chart coupons recovered the bacteria after drying, within the ranges of 6 to 8 logs. [See Scrub Chart Recoveries in Tables 3, 4]. We had missed to include the blank charts in one or two instances..." 2. "Paint Lot # 2: The coated untreated and treated charts do not go through the exposure to the scrub cycle to chemical. We found the unexposed untreated coupons yielded the required minimum ~6 log recovery of the two bacteria per method acceptance criterion. The treated coupons showed excellent efficacy against both bacteria up to greater than 4 to 6 log reductions in all samples, meeting the EPA's Product Efficacy of 99.9% and Acceptance criteria of ≤3 log reductions. Hence, the need to demonstrate recovery in uncoated blank charts was not believed to be necessary and are not included in the study." <p>No Protocol Amendments were reported.</p>
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2.	MRID	51433506
Study Objective	Supplemental Residual Antimicrobial Product, Surface Paints – Viral	
Testing Lab; Lab Study ID	Water and Energy Sustainable Technology (WEST) Center; Lab Study ID not provided	

Experimental Start Date		9/26/2020	Study Completion Date:	1/27/2021
			Amended Study Date:	5/8/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		Feline calicivirus, Strain F-9 (ATCC VR-782)		
Indicator Cell Culture		Crandell-Rees Feline Kidney (CRFK) cells (ATCC CCL-94)		
Test Method		Protocol for the Evaluation of Virucidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141402; EPA Memorandum 89661-2_DP457456		
Application Method		Two coats of paint are applied using the standard drawdown technique and allowed to dry for ≥ 24 hours.		
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor		
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2		
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A		
Soil load		5% Fetal Bovine Serum (FBS)		
Carrier type, # per lot		1" x 1" square coupons from the center of painted scrub test panels;		
Test conditions		Contact time: 2 hours Temperature: 20°C Relative humidity: 50%		
Neutralizer		Sephadex G-10 columns		
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		<p>Note:</p> <ul style="list-style-type: none"> Amended Final Report included in "Cover Letter Response to EPA 75 Deficiency Letter" dated May 14, 2021 Non-GLP Study – deviations from GLP standards are included on page 5 of the report. Wear testing conducted using the following cleaning agents: Clorox, VirexTB, and 3% hydrogen peroxide Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>Protocol Deviations:</p> <ol style="list-style-type: none"> Protocol MRID 51141402 specifies that three (3) untreated control carriers and five (5) treated carriers are to be tested per production lot of base paint. For the study described herein, two (2) untreated control carriers and two (2) treated carriers were tested per 		

	<p>production lot of base paint at the direction of the Study Sponsor.</p> <ol style="list-style-type: none"> 2. Protocol MRID 51141402 states in Section C that the supernatant fluid generated during propagation of the test virus serves as the stock virus for the test. For the study described herein, the viral supernatant underwent a polyethylene glycol (8,000 m.w.) extraction and Vertrel treatment to further concentrate and prepare high titer stocks for testing. 3. Protocol MRID 51141402 states in Section E that each dilution is to be added to four well of confluent host cell monolayers. For the study described herein, dilutions for all samples were plated in replicates of six per dilution (100 µL per well) to increase precision for calculation of viral and cytotoxicity titers. <p>No Protocol Amendments were reported.</p>
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3.	MRID	51433507	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Bacterial	
Testing Lab; Lab Study ID		Siva Microbiological Solutions, LLC; Final Report No. 2021-05	
Experimental Start Date		Lot 1: 10/24/2020 Lot 2: 12/24/2020	Study Completion Date: 1/15/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		<i>Klebsiella aerogenes</i> (ATCC 13048)	
Test Method		Protocol for the Evaluation of Bactericidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141401; EPA Memorandum 89661-2_DP457456	
Application Method		Apply paint using the standard drawdown technique	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% Fetal Bovine Serum (FBS)	
Carrier type, # per lot		1 x 1 square inch coupon from the painted scrub test panels;	
Test conditions		Contact time: 2 hours Temperature: 19.2-20.7°C Relative humidity: 42.6-47.2%	
Neutralizer		Lethen Broth	
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		Notes: <ul style="list-style-type: none"> • Non-GLP Study – Per the GLP Statement on page 5 of the study report, the study was conducted in compliance with U.S. Environmental Protection Agency Good Laboratory Practice (GLP) regulations set forth in 40 CFR Part 160 with the exception of: Part 160.35 (a)- Testing facility will 	

	<p>have a QA unit responsible for monitoring each study to assure management that facilities, equipment, personnel, methods, practices, records and controls are in conformance with the regulations.</p> <ul style="list-style-type: none"> • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>No Protocol Amendments or Protocol Deviations were reported in the study.</p>
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4.	MRID	51433508	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Bacterial	
Testing Lab; Lab Study ID		Siva Microbiological Solutions, LLC; Final Report No. 2021-07	
Experimental Start Date		Lot 1: 10/24/2020 Lot 2: 12/24/2020	Study Completion Date: 1/15/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) (ATCC 3359)	
Test Method		Protocol for the Evaluation of Bactericidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141401; EPA Memorandum 89661-2_DP457456	
Application Method		Apply paint using the standard drawdown technique	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% Fetal Bovine Serum (FBS)	
Carrier type, # per lot		1 x 1 square inch coupon from the painted scrub test panels;	
Test conditions		Contact time: 2 hours Temperature: 19.2-20.7°C Relative humidity: 42.6-47.2%	
Neutralizer		Lethen Broth	
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		<p>Notes:</p> <ul style="list-style-type: none"> • Non-GLP Study – Per the GLP Statement on page 5 of the study report, the study was conducted in compliance with U.S. Environmental Protection Agency Good Laboratory Practice (GLP) regulations set forth in 40 CFR Part 160 with the exception of: Part 160.35 (a)- Testing facility will 	

	<p>have a QA unit responsible for monitoring each study to assure management that facilities, equipment, personnel, methods, practices, records and controls are in conformance with the regulations.</p> <ul style="list-style-type: none"> • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>No Protocol Amendments or Protocol Deviations were reported in the study.</p>
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5.	MRID	51433509	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Bacterial	
Testing Lab; Lab Study ID		Siva Microbiological Solutions, LLC; Final Report No. 2021-08	
Experimental Start Date		Lot 1: 10/24/2020 Lot 2: 12/24/2020	Study Completion Date: 1/15/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		<i>Escherichia coli</i> O157:H7 (ATCC 35150)	
Test Method		Protocol for the Evaluation of Bactericidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141401; EPA Memorandum 89661-2_DP457456	
Application Method		Apply paint using standard drawdown technique	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% Fetal Bovine Serum (FBS)	
Carrier type, # per lot		1 x 1 square inch coupon from the painted scrub test panels;	
Test conditions		Contact time: 2 hours Temperature: 19.2-20.7°C Relative humidity: 42.6-47.2%	
Neutralizer		Lethen Broth	
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		<p>Notes:</p> <ul style="list-style-type: none"> • Non-GLP Study – Per the GLP Statement on page 5 of the study report, the study was conducted in compliance with U.S. Environmental Protection Agency Good Laboratory Practice (GLP) regulations set forth in 40 CFR Part 160 with the exception of: Part 160.35 (a)- Testing facility will have a QA unit responsible for monitoring each study to 	

	<p>assure management that facilities, equipment, personnel, methods, practices, records and controls are in conformance with the regulations.</p> <ul style="list-style-type: none"> • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>No Protocol Amendments or Protocol Deviations were reported in the study.</p>
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6.	MRID	51433510	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Bacterial	
Testing Lab; Lab Study ID		Siva Microbiological Solutions, LLC; Final Report No. 2021-012	
Experimental Start Date		Lot 1: 10/24/2020 Lot 2: 12/24/2020	Study Completion Date: 1/15/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		<i>Enterococcus faecium</i> (ATCC 29212)	
Test Method		Protocol for the Evaluation of Bactericidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141401; EPA Memorandum 89661-2_DP457456	
Application Method		Apply paint using standard drawdown technique	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% Fetal Bovine Serum (FBS)	
Carrier type, # per lot		1 x 1 square inch coupon from the painted scrub test panels;	
Test conditions		Contact time: 2 hours Temperature: 19.2-20.7°C Relative humidity: 42.6-47.2%	
Neutralizer		Lethen Broth	
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		<p>Notes:</p> <ul style="list-style-type: none"> • Non-GLP Study – Per the GLP Statement on page 5 of the study report, the study was conducted in compliance with U.S. Environmental Protection Agency Good Laboratory Practice (GLP) regulations set forth in 40 CFR Part 160 with the exception of: Part 160.35 (a)- Testing facility will have a QA unit responsible for monitoring each study to 	

	<p>assure management that facilities, equipment, personnel, methods, practices, records and controls are in conformance with the regulations.</p> <ul style="list-style-type: none"> • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>No Protocol Amendments or Protocol Deviations were reported in the study.</p>
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7.	MRID	51433511	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Bacterial	
Testing Lab; Lab Study ID		Siva Microbiological Solutions, LLC; Final Report No. 2021-09	
Experimental Start Date		Lot 1: 10/24/2020 Lot 2: 12/24/2020	Study Completion Date: 1/15/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		Salmonella enterica (ATCC 10708)	
Test Method		Protocol for the Evaluation of Bactericidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141401; EPA Memorandum 89661-2_DP457456	
Application Method		Apply paint using standard drawdown technique	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% Fetal Bovine Serum (FBS)	
Carrier type, # per lot		1 x 1 square inch coupon from the painted scrub test panels;	
Test conditions		Contact time: 2 hours Temperature: 19.2-20.7°C Relative humidity: 42.6-47.2%	
Neutralizer		Lethen Broth	
Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)		<p>Notes:</p> <ul style="list-style-type: none"> • Non-GLP Study – Per the GLP Statement on page 5 of the study report, the study was conducted in compliance with U.S. Environmental Protection Agency Good Laboratory Practice (GLP) regulations set forth in 40 CFR Part 160 with the exception of: Part 160.35 (a)- Testing facility will have a QA unit responsible for monitoring each study to assure management that facilities, equipment, personnel, 	

	<p>methods, practices, records and controls are in conformance with the regulations.</p> <ul style="list-style-type: none"> • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>No Protocol Amendments or Protocol Deviations were reported in the study.</p>
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8.	MRID	51433512	
Study Objective		Supplemental Residual Antimicrobial Product, Surface Paints – Viral	
Testing Lab; Lab Study ID		Water and Energy Sustainable Technology (WEST) Center; Lab Study ID not provided	
Experimental Start Date		11/3/2020	Study Completion Date: 1/27/2021 Amended Study Date: 5/8/2021
Test organism(s) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+		SARS-CoV-2, Isolate USA-WA1/2020 (Source: BEI Resources NR-52281)	
Indicator Cell Culture		Vero E6 (African Green Monkey kidney) cells (ATCC CRL-1586)	
Test Method		Protocol for the Evaluation of Virucidal Activity of Antimicrobial Coated Surfaces, Corning Incorporated, MRID 51141402; EPA Memorandum 89661-2_DP457456	
Application Method		Two coats of paint are applied using the standard drawdown technique and allowed to dry for ≥24 hours.	
Test Substance Preparation	Name/ID	PPG Architectural Coatings – Copper Armor	
	Lots <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	Lot 1 Lot 2	
	Preparation	Tested concentration: See post-test chemical analysis of test samples listed above Tested Dilution: Ready-to-use Diluent: N/A	
Soil load		5% Fetal Bovine Serum (FBS)	
Carrier type, # per lot		1" x 1" square coupons from the center of painted scrub test panels; Four treated test carriers and two untreated control carriers per formulation	
Test conditions		Contact time: 2 hours Temperature: 20°C Relative humidity: 50%	
Neutralizer		Sephadex G-10 columns	

<p>Reviewer comments (i.e. protocol deviations and amendments, retesting, control failures, etc.)</p>	<p>Note:</p> <ul style="list-style-type: none"> • Amended Final Report No. 2021-013b included in “Cover Letter Response to EPA 75 Deficiency Letter” dated May 14, 2021 • Non-GLP Study – deviations form GLP standards are included on page 5 of the report. • Wear testing conducted using the following cleaning agents: Clorox, VirexTB, and 3% hydrogen peroxide • Certificates of Analysis (CoA) with chemical analyses reflecting a date before the efficacy testing per the 810 guidelines) for each of the product lots tested in all the submitted efficacy studies as it relates to the subject product and its active ingredients were not submitted by the Applicant. However, in written correspondence from PPG dated July 14, 2021, chemical analyses of the test samples post-efficacy testing were provided. <p>Protocol Deviations:</p> <ol style="list-style-type: none"> 1. Protocol MRID 51141402 specifies that three (3) untreated control carriers and five (5) treated carriers are to be tested per production lot of base paint. For the study described herein, two (2) untreated control carriers and four (4) treated carriers were tested per production lot of base paint at the direction of the Study Sponsor. 2. Protocol MRID 51141402 states in Section C that the supernatant fluid generated during propagation of the test virus serves as the stock virus for the test. For the study described herein, the viral supernatant underwent a polyethylene glycol (8,000 m.w.) extraction to further concentrate and prepare high titer stocks for testing. 3. Protocol MRID 51141402 states in Section E that each dilution is to be added to four well of confluent host cell monolayers. For the study described herein, dilutions for all samples were plated in replicates of six per dilution (100 µL per well) to increase precision for calculation of viral and cytotoxicity titers. <p>No Protocol Amendments were reported.</p>
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V STUDY RESULTS

Supplemental Residual Antimicrobial Product – Surface Paints Efficacy

Table 1. Lot 1 – Production formulations of the painted Leneta scrub charts used in study reports. For Lot 1, coated untreated and treated coupons underwent exposures to three cleaners (with prescribed wash cycles).

Note: Per MRID 51433501, on page 24 of 63, “1.) PPG has determined that [] for the purposes of this submission only PPG colorants will be utilized (i.e. no Sherwin Williams or BASF colorants will be used commercially), and 2.) label statements to preclude the use of quaternary ammonium cleaners and to indicate the use of bleach and peroxide cleaners only.”

However, in an email dated May 12, 2021 to EPA (T. Blackburn), PPG requested the following: “There would be no additional studies submitted for the Sherwin Williams colorants. Per our August 2020 meeting and the agreed upon test plan, PPG tested Sherwin Williams carbon black colorant. That data is already included in the studies which have been submitted. At the time of submission (January 2021), we only asked for approval for the PPG colorants for the sake of “simplicity”, but now believe that given the efficacy results that have already been submitted for the Sherwin Williams colorants, approval for those colorants should be considered alongside the PPG colorants. As EPA already has the data, we did not believe that a due date extension would be required.” In an email to PPG dated May 16, 2021, the EPA (T. Blackburn) agreed to “review the data for SW carbon black with the current submission.”

ID Code	Tint	Treatment and Exposure
CP-8026	Untinted without Copper	Unexposed, Untreated Coupons
		Exposed, Treated Coupons
CP-8040	Untinted with Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons
CP-8028	PPG Raw Umber (Tint A) without Copper	Unexposed, Untreated Coupons
		Exposed, Untreated Coupons
CP-8042	PPG Raw Umber (Tint A) with Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons
CP-8030	PPG Formula Pro Durable Red (Tint B) without Copper	Unexposed, Untreated Coupons
		Exposed, Untreated Coupons
CP-8044	PPG Formula Pro Durable Red (Tint B) with Copper	Exposed, Treated Coupons
		Unexposed, Untreated Coupons
CP-8032	PPG Formula Pro Black (Tint C) without Copper	Unexposed, Untreated Coupons
		Exposed, Untreated Coupons
CP-8046	PPG Formula Pro Black (Tint C) with Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons
CP-8034	BASF Raw Umber (Tint D) without Copper	Unexposed, Untreated Coupons
		Exposed, Untreated Coupons
CP-8048	BASF Raw Umber (Tint D) with Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons
CP-8036	Sherwin Williams Black (Tint E) without Copper	Unexposed, Untreated Coupons
		Exposed, Untreated Coupons
CP-8050	Sherwin Williams Black (Tint E) with Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons

CP-8038	PPG Futurity Durable Red (Tint F) without Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons
CP-8052	PPG Futurity Durable Red (Tint F) with Copper	Unexposed, Treated Coupons
		Exposed, Treated Coupons

Untreated = without Copper

Treated = with Copper

Unexposed = without Wear Cycles

Exposed = with Wear Cycles (using three different cleaners)

Table 2. Lot 2 – Production formulations of the painted Leneta scrub charts used in study reports. For Lot 2, coated untreated and treated coupons did not undergo exposures to the scrub cycles and chemical cleaners.

ID Code	Tint	Treatment
CP-8027	Untinted without Copper	Unexposed, Untreated Coupons
CP-8041	Untinted with Copper	Unexposed, Treated Coupons
CP-8029	PPG Raw Umber (Tint A) without Copper	Unexposed, Untreated Coupons
CP-8043	PPG Raw Umber (Tint A) with Copper	Unexposed, Treated Coupons
CP-8031	PPG Formula Pro Durable Red (Tint B) without Copper	Unexposed, Untreated Coupons
CP-8045	PPG Formula Pro Durable Red (Tint B) with Copper	Unexposed, Treated Coupons
CP-8033	PPG Formula Pro Black (Tint C) without Copper	Unexposed, Untreated Coupons
CP-8047	PPG Formula Pro Black (Tint C) with Copper	Unexposed, Treated Coupons
CP-8035	BASF Raw Umber (Tint D) without Copper	Unexposed, Untreated Coupons
CP-8049	BASF Raw Umber (Tint D) with Copper	Unexposed, Treated Coupons
CP-8037	Sherwin Williams Black (Tint E) without Copper	Unexposed, Untreated Coupons
CP-8051	Sherwin Williams Black (Tint E) with Copper	Unexposed, Treated Coupons
CP-8039	PPG Futurity Durable Red (Tint F) without Copper	Unexposed, Untreated Coupons
CP-8053	PPG Futurity Durable Red (Tint F) with Copper	Unexposed, Treated Coupons
CP-8133†	Untinted without Copper	Unexposed
CP-8135†	Untinted with Copper	Unexposed
CP-8138†	PPG Futurity Durable Red (Tint F) without Copper	Unexposed, Untreated Coupons
CP-8139†	PPG Futurity Durable Red (Tint F) with Copper	Unexposed, Treated Coupons
CP-8147†	PPG Formula Pro Iron Oxide without Copper	Unexposed
CP-8122†	PPG Formula Pro Iron Oxide with Copper	Unexposed

Untreated = without Copper

Treated = with Copper

Unexposed = without Wear Cycles

† = Used in SARS-CoV-2 testing only

Table 3a. Lot 1 – *Pseudomonas aeruginosa* (ATCC 15442)

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
51433505	Pseudomonas aeruginosa (ATCC 15442)	CP-8026	Untinted, without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.91	N/A	N/A	7.12
				Cleaner 1 / Clorox	6.59	N/A	N/A	
				Cleaner 2 / VirexTB	6.06	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	6.89	N/A	N/A	
		CP-8040	Untinted with Copper	No Cleaner/ No Wear Cycles (Unexposed)	1.53	5.38	5.38	7.12
				Cleaner 1 / Clorox	0	6.59	6.91	
				Cleaner 2 / VirexTB	1.44	4.62	5.48	
				Cleaner 3 / 3% Hydrogen Peroxide	0	6.89	6.91	
		CP-8028	PPG Raw Umber (Tint A) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	7.14	N/A	N/A	7.12
				Cleaner 1 / Clorox	6.89	N/A	N/A	
				Cleaner 2 / VirexTB	4.77	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	7.14	N/A	N/A	

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
		CP-8042	PPG Raw Umber (Tint A) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	1.53	5.61	5.61	7.12
				Cleaner 1 / Clorox	1.33	5.56	5.81	
				Cleaner 2 / VirexTB	4.21	0.56	2.93	
				Cleaner 3 / 3% Hydrogen Peroxide	1.77	5.37	5.37	
		CP-8030	PPG Formula Pro Durable Red (Tint B) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.18	N/A	N/A	7.12
				Cleaner 1 / Clorox	5.43	N/A	N/A	
				Cleaner 2 / VirexTB	6.26	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	4.67	N/A	N/A	
		CP-8044	PPG Formula Pro Durable Red (Tint B) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	1.53	5.61	5.61	7.12
				Cleaner 1 / Clorox	1.33	5.56	5.81	
				Cleaner 2 / VirexTB	4.21	0.56	2.93	
				Cleaner 3 / 3% Hydrogen Peroxide	1.77	5.37	5.37	

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
		CP-8032	PPG Formula Pro Black (Tint C) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	5.94	N/A	N/A	7.48
				Cleaner 1 / Clorox	5.41	N/A	N/A	
				Cleaner 2 / VirexTB	4.96	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	3.48	N/A	N/A	
		CP-8046	PPG Formula Pro Black (Tint C) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	0	5.94	5.94	7.48
				Cleaner 1 / Clorox	0	5.41	5.94	
				Cleaner 2 / VirexTB	0.88	4.08	5.06	
				Cleaner 3 / 3% Hydrogen Peroxide	0	3.48	5.94	
		CP-8036	Sherwin Williams Black (Tint E) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	7.22	N/A	N/A	7.54
				Cleaner 1 / Clorox	6.61	N/A	N/A	
				Cleaner 2 / VirexTB	6.78	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	6.89	N/A	N/A	

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
		CP-8050	Sherwin Williams Black (Tint E) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	1.59	5.63	5.63	7.54
				Cleaner 1 / Clorox	1.93	4.68	5.29	
				Cleaner 2 / VirexTB	0	6.78	7.22	
				Cleaner 3 / 3% Hydrogen Peroxide	2.11	4.78	5.11	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	7.11	N/A	N/A	7.23
				Cleaner 1 / Clorox	6.7	N/A	N/A	
				Cleaner 2 / VirexTB	6.88	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	7.07	N/A	N/A	
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	2.06	5.05	5.05	7.23
				Cleaner 1 / Clorox	0	6.7	7.11	
				Cleaner 2 / VirexTB	6.48	0.4	0.63	
				Cleaner 3 / 3% Hydrogen Peroxide	3.3	3.77	3.81	

Average of 3 replicates for unexposed coupons and average of 5 replicates for treated coupons.

Table 3b. Lot 2 – *Pseudomonas aeruginosa* (ATCC 15442)

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results	
				Average Recovery (Log ₁₀ /carrier)	Log ₁₀ /carrier Reduction
Lot 2: 2-hour contact time, without Wear Cycles					
51433505	Pseudomonas aeruginosa (ATCC 15442)	CP-8026	Untinted, without Copper	5.27	N/A
		CP-8041	Untinted with Copper	0	5.27
		CP-8029	PPG Raw Umber (Tint A) without Copper	6.59	N/A
		CP-8043	PPG Raw Umber (Tint A) with Copper	0.83	5.76
		CP-8031	PPG Formula Pro Durable Red (Tint B) without Copper	5.13	N/A
		CP-8045	PPG Formula Pro Durable Red (Tint B) with Copper	0	5.13
		CP-8033	PPG Formula Pro Black (Tint C) without Copper	6.27	N/A
		CP-8047	PPG Formula Pro Black (Tint C) with Copper	0	6.27
		CP-8037	Sherwin Williams Black (Tint E) without Copper	6.55	N/A
		CP-8051	Sherwin Williams Black (Tint E) with Copper	3.14	3.41
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	4.97	N/A
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0	4.97

Average of 3 replicates for unexposed coupons and average of 5 replicates for treated coupons.

Table 4a. Lot 1 – *Staphylococcus aureus* (ATCC 6538)

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
51433505	Staphylococcus aureus (ATCC 6538)	CP-8026	Untinted, without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.88	N/A	N/A	7.36
				Cleaner 1 / Clorox	6.41	N/A	N/A	
				Cleaner 2 / VirexTB	6.89	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	6.55	N/A	N/A	
		CP-8040	Untinted with Copper	No Cleaner/ No Wear Cycles (Unexposed)	1.19	5.69	5.69	7.36
				Cleaner 1 / Clorox	0	6.41	6.88	
				Cleaner 2 / VirexTB	3.31	3.58	3.57	
				Cleaner 3 / 3% Hydrogen Peroxide	0.69	5.89	6.19	
		CP-8028	PPG Raw Umber (Tint A) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	7.28	N/A	N/A	6.9
				Cleaner 1 / Clorox	6.34	N/A	N/A	
				Cleaner 2 / VirexTB	5.88	N/A	N/A	

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
				Cleaner 3 / 3% Hydrogen Peroxide	7.26	N/A	N/A	6.9
		CP-8042	PPG Raw Umber (Tint A) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	0	7.28	7.28	
				Cleaner 1 / Clorox	0	6.34	7.28	
				Cleaner 2 / VirexTB	4.84	1.04	2.44	
				Cleaner 3 / 3% Hydrogen Peroxide	0	7.26	7.28	
		CP-8030	PPG Formula Pro Durable Red (Tint B) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.18	N/A	N/A	6.79
				Cleaner 1 / Clorox	5.43	N/A	N/A	
				Cleaner 2 / VirexTB	6.26	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	4.67	N/A	N/A	
		CP-8044	PPG Formula Pro Durable Red (Tint B) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	0.83	5.35	5.35	6.79
				Cleaner 1 / Clorox	0.63	4.8	5.55	

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
				Cleaner 2 / VirexTB	0.9	5.36	5.28	
				Cleaner 3 / 3% Hydrogen Peroxide	0.46	4.21	5.72	
		CP-8032	PPG Formula Pro Black (Tint C) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.64	N/A	N/A	6.82
				Cleaner 1 / Clorox	1.49	N/A	N/A	
				Cleaner 2 / VirexTB	5.82	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	6.19	N/A	N/A	
		CP-8046	PPG Formula Pro Black (Tint C) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	0	6.64	6.64	6.82
				Cleaner 1 / Clorox	0	1.49 6.82*	6.64	
				Cleaner 2 / VirexTB	3.09	2.73	3.55	
				Cleaner 3 / 3% Hydrogen Peroxide	0.46	5.73	6.18	
		CP-8036	Sherwin Williams Black (Tint E)	No Cleaner/ No Wear Cycles (Unexposed)	6.03	N/A	N/A	7.53

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
			without Copper	Cleaner 1 / Clorox	3.31	N/A	N/A	
				Cleaner 2 / VirexTB	4.21	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	3.28	N/A	N/A	
		CP-8050	Sherwin Williams Black (Tint E) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	0	6.03	6.03	7.53
				Cleaner 1 / Clorox	0	3.31	6.03	
				Cleaner 2 / VirexTB	0	4.21	6.03	
				Cleaner 3 / 3% Hydrogen Peroxide	0	3.28	6.03	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	7.09	N/A	N/A	Not Tested
				Cleaner 1 / Clorox	6.72	N/A	N/A	
				Cleaner 2 / VirexTB	7.18	N/A	N/A	
				Cleaner 3 / 3% Hydrogen Peroxide	7.18	N/A	N/A	

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery
				Chemical Used	Average Recovery (Log ₁₀ /carrier)	Log ₁₀ Reduction (Untreated, Exposed comparison)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	
Lot 1: 2-hour contact time, with Wear Cycles								
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	2.39	4.7	4.7	Not Tested
				Cleaner 1 / Clorox	0	6.72	7.09	
				Cleaner 2 / VirexTB	1.12	6.06	5.97	
				Cleaner 3 / 3% Hydrogen Peroxide	0.63	6.55	6.46	

Average of 3 replicates for unexposed coupons and average of 5 replicates for treated coupons.

*Base on uncoated scrub chart recoveries and subtracting with Copper data from CP-8046 with Cleaner 2.

Table 4b. Lot 2 – *Staphylococcus aureus* (ATCC 6538)

MRID	Organism	Formulation ID Code	Tint and Treatment Description	Results	
				Average Recovery (Log ₁₀ / carrier)	Log ₁₀ /carrier Reduction
Lot 2: 2-hour contact time, without Wear Cycles					
51433505	Staphylococcus aureus (ATCC 6538)	CP-8027	Untinted, without Copper	5.04	N/A
		CP-8041	Untinted with Copper	0	5.04
		CP-8029	PPG Raw Umber (Tint A) without Copper	5.04	N/A
		CP-8043	PPG Raw Umber (Tint A) with Copper	0.46	4.58
		CP-8031	PPG Formula Pro Durable Red (Tint B) without Copper	5.69	N/A
		CP-8045	PPG Formula Pro Durable Red (Tint B) with Copper	0	5.69
		CP-8033	PPG Formula Pro Black (Tint C) without Copper	6.2	N/A
		CP-8047	PPG Formula Pro Black (Tint C) with Copper	0	6.2
		CP-8037	Sherwin Williams Black (Tint E) without Copper	6.05	N/A
		CP-8051	Sherwin Williams Black (Tint E) with Copper	0	6.05
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	4.97	N/A
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0	4.97

Average of 3 replicates for unexposed coupons and average of 5 replicates for treated coupons.

Table 5a. Lot 1 – Feline Calicivirus (ATCC VR-782)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Chemical Used	Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 1: 2-hour contact time, with Wear Cycles									
51433506 (9/28/2020)	Feline Calicivirus, Strain F-9 (ATCC VR- 782)	CP-8026	Untinted, without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.42	N/A	-0.5	5.92	5.00
				Cleaner 1 / Clorox	5.92	0.50	0.00		
				Cleaner 2 / VirexTB	5.67	0.75	N/A		
				Cleaner 3 / 3% Hydrogen Peroxide	5.17	1.25	0.75		
(9/28/2020)		CP-8040	Untinted with Copper	No Cleaner/ No Wear Cycles (Unexposed)	< 0.50	> 5.92	> 5.42	5.92	5.00
				Cleaner 1 / Clorox	< 1.67	> 4.75	> 4.25		
				Cleaner 2 / VirexTB	5.25	1.17	N/A		
				Cleaner 3 / 3% Hydrogen Peroxide	< 0.50	> 5.92	> 5.42		
(9/29/2020)		CP-8028	PPG Raw Umber (Tint A) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	5.83	N/A	0.25	6.08	4.83
				Cleaner 1 / Clorox	5.42	0.42	0.67		
				Cleaner 2 / VirexTB	5.42	0.42	N/A		

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Chemical Used	Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 1: 2-hour contact time, with Wear Cycles									
				Cleaner 3 / 3% Hydrogen Peroxide	5.92	-0.08	0.17		
(9/29/2020)		CP-8042	PPG Raw Umber (Tint A) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	< 1.50	> 4.33	> 4.58	6.08	4.83
				Cleaner 1 / Clorox	< 1.50	> 4.33	> 4.58		
				Cleaner 2 / VirexTB	5.17	0.67	N/A		
				Cleaner 3 / 3% Hydrogen Peroxide	3.08	2.75	3.00		
(10/5/2020)		CP-8030	PPG Formula Pro Durable Red (Tint B) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.42	N/A	-0.50	5.92	5.50
				Cleaner 1 / Clorox	5.92	0.50	0.00		
				Cleaner 2 / VirexTB	5.67	0.75	N/A		
				Cleaner 3 / 3% Hydrogen Peroxide	4.83	1.58	1.08		
(10/5/2020)		CP-8044	PPG Formula Pro Durable Red (Tint B) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	< 1.58	> 4.83	> 4.33	5.92	5.50
	Cleaner 1 / Clorox			< 1.50	> 4.92	> 4.42			

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Chemical Used	Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 1: 2-hour contact time, with Wear Cycles									
				Cleaner 2 / VirexTB	4.17	2.25	N/A		
				Cleaner 3 / 3% Hydrogen Peroxide	< 1.50	> 4.92	> 4.42		
(10/6/2020)		CP-8032	PPG Formula Pro Black (Tint C) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.17	N/A	-0.17	6.00	5.83
				Cleaner 1 / Clorox	6.00	0.17	0.00		
				Cleaner 2 / VirexTB	5.92	0.25	0.08		
				Cleaner 3 / 3% Hydrogen Peroxide	5.33	0.83	0.67		
(10/6/2020)				CP-8046	PPG Formula Pro Black (Tint C) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	< 1.50		
Cleaner 1 / Clorox		< 1.50	> 4.67			> 4.50			
Cleaner 2 / VirexTB		4.67	1.50			N/A			
Cleaner 3 / 3% Hydrogen Peroxide		< 1.50	> 4.67			> 4.50			
(10/9/2020)		CP-8036	Sherwin Williams Black (Tint	No Cleaner/ No Wear Cycles (Unexposed)	6.00	N/A	0.00	6.00	4.83

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Chemical Used	Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 1: 2-hour contact time, with Wear Cycles									
(10/9/2020)			E) without Copper	Cleaner 1 / Clorox	6.00	0.00	0.00		
				Cleaner 2 / VirexTB	6.00	0.00	0.00		
				Cleaner 3 / 3% Hydrogen Peroxide	5.67	0.33	0.33		
		CP-8050	Sherwin Williams Black (Tint E) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	< 1.50	> 4.50	> 4.50	6.00	4.83
				Cleaner 1 / Clorox	2.75	3.25	3.25		
				Cleaner 2 / VirexTB	2.33	3.67	3.67		
				Cleaner 3 / 3% Hydrogen Peroxide	2.83	3.17	3.17		
(10/12/2020)		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	No Cleaner/ No Wear Cycles (Unexposed)	6.50	N/A	-0.67	5.83	5.00
				Cleaner 1 / Clorox	5.83	0.67	0.00		
				Cleaner 2 / VirexTB	5.83	0.67	.00		
				Cleaner 3 / 3% Hydrogen Peroxide	5.92	0.58	-0.08		

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results				Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Chemical Used	Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 1: 2-hour contact time, with Wear Cycles									
(10/12/2020)		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	No Cleaner/ No Wear Cycles (Unexposed)	< 1.50	> 5.00	> 4.33	5.83	5.00
				Cleaner 1 / Clorox	< 1.50	> 5.00	> 4.33		
				Cleaner 2 / VirexTB	5.50	1.00	0.33		
				Cleaner 3 / 3% Hydrogen Peroxide	< 1.50	> 5.00	> 4.33		

Average of 2 replicates for unexposed coupons and treated coupons.

Table 5b. Lot 2 – Feline Calicivirus, Strain F-9 (ATCC VR-782)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 2: 2-hour contact time, without Wear Cycles								
51433506 (10/21/2020)	Feline Calicivirus, Strain F-9 (ATCC VR-782)	CP-8027	Untinted, without Copper	6.67	N/A	-0.42	6.25	5.50
		CP-8041	Untinted with Copper	< 1.50	> 5.17	> 4.75		
		CP-8029	PPG Raw Umber (Tint A) without Copper	5.92	N/A	N/A		
		CP-8043	PPG Raw Umber (Tint A) with Copper	< 1.50	> 4.42	> 4.75		
		CP-8031	PPG Formula Pro Durable Red (Tint B) without Copper	5.92	N/A	0.33		
		CP-8045	PPG Formula Pro Durable Red (Tint B) with Copper	< 1.50	> 4.42	> 4.75		
		CP-8033	PPG Formula Pro Black (Tint C) without Copper	5.58	N/A	0.67		
		CP-8047	PPG Formula Pro Black (Tint C) with Copper	< 1.50	> 4.08	> 4.75		
		CP-8037	Sherwin Williams Black (Tint E) without Copper	6.42	N/A	-0.17		
		CP-8051	Sherwin Williams Black (Tint E) with Copper	< 1.50	> 4.58	> 4.75		
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	6.08	N/A	N/A		
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	< 1.50	> 4.58	> 4.75		

Average of 2 replicates for unexposed coupons and treated coupons.

Table 6a. Lot 1 – *Klebsiella aerogenes* (ATCC 13048)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 1: 2-hour contact time, without Wear Cycles							
51433507	Klebsiella aerogenes (ATCC 13048)	CP-8026	Untinted, without Copper	7.71	N/A	N/A	7.72
		CP-8040	Untinted with Copper	0.95	6.76	6.77	
		CP-8028	PPG Raw Umber (Tint A) without Copper	7.29	N/A	N/A	
		CP-8042	PPG Raw Umber (Tint A) with Copper	4.28	3.01	3.44	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	7.68	N/A	N/A	
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	3.66	4.02	4.06	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 6b. Lot 2 – *Klebsiella aerogenes* (ATCC 13048)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 2: 2-hour contact time, without Wear Cycles							
51433507	Klebsiella aerogenes (ATCC 13048)	CP-8027	Untinted, without Copper	3.56	N/A	N/A	6.70
		CP-8041	Untinted with Copper	0.00	3.56	6.7	
		CP-8029	PPG Raw Umber (Tint A) without Copper	3.54	N/A	N/A	
		CP-8043	PPG Raw Umber (Tint A) with Copper	0.00	3.54	6.7	
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	6.14	N/A	N/A	
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0.00	6.14	6.7	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 7a. Lot 1 – Methicillin-resistant *Staphylococcus aureus* (MRSA) (ATCC 3359)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 1: 2-hour contact time, without Wear Cycles							
51433508	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) (ATCC 3359)	CP-8026	Untinted, without Copper	5.88	N/A	N/A	5.45
		CP-8040	Untinted with Copper	0	5.88	5.45	
		CP-8028	PPG Raw Umber (Tint A) without Copper	5.93	N/A	N/A	
		CP-8042	PPG Raw Umber (Tint A) with Copper	0	5.93	5.45	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	5.93	N/A	N/A	
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	0	5.93	5.45	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 7b. Lot 2 – Methicillin-resistant *Staphylococcus aureus* (MRSA) (ATCC 3359)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 2: 2-hour contact time, without Wear Cycles							
51433508	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) (ATCC 3359)	CP-8027	Untinted, without Copper	6.56	N/A	N/A	6.99
		CP-8041	Untinted with Copper	0.00	6.56	6.99	
		CP-8029	PPG Raw Umber (Tint A) without Copper	6.66	N/A	N/A	
		CP-8043	PPG Raw Umber (Tint A) with Copper	1.99	4.67	5	
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	6.58	N/A	N/A	
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	2.94	3.64	4.05	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 8a. Lot 1 – *Escherichia coli* O157:H7 (ATCC 35150)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 1: 2-hour contact time, without Wear Cycles							
51433509	<i>Escherichia coli</i> O157:H7 (ATCC 35150)	CP-8026	Untinted, without Copper	6.97	N/A	N/A	7.39
		CP-8040	Untinted with Copper	0.00	6.97	7.39	
		CP-8028	PPG Raw Umber (Tint A) without Copper	6.94	N/A	N/A	
		CP-8042	PPG Raw Umber (Tint A) with Copper	0.00	6.94	7.39	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	6.56	N/A	N/A	
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	0.00	6.56	7.39	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 8b. Lot 2 – *Escherichia coli* O157:H7 (ATCC 35150)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 2: 2-hour contact time, without Wear Cycles							
51433509	<i>Escherichia coli</i> O157:H7 (ATCC 35150)	CP-8027	Untinted, without Copper	4.62	N/A	N/A	5.51
		CP-8041	Untinted with Copper	0	4.62	5.51	
		CP-8029	PPG Raw Umber (Tint A) without Copper	4.49	N/A	N/A	
		CP-8043	PPG Raw Umber (Tint A) with Copper	0	4.49	5.51	
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	3.98	N/A	N/A	
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0	3.98	5.51	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 9a. Lot 1 – *Enterococcus faecium* (ATCC 29212)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 1: 2-hour contact time, without Wear Cycles							
51433510	<i>Enterococcus faecium</i> (ATCC 29212)	CP-8026	Untinted, without Copper	6.4	N/A	N/A	5.92
		CP-8040	Untinted with Copper	0.67	5.73	5.25	
		CP-8028	PPG Raw Umber (Tint A) without Copper	6.55	N/A	N/A	
		CP-8042	PPG Raw Umber (Tint A) with Copper	1.65	4.9	4.27	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	6.14	N/A	N/A	
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	0	6.14	5.92	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 9b. Lot 2 – *Enterococcus faecium* (ATCC 29212)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 2: 2-hour contact time, without Wear Cycles							
51433510	Enterococcus faecium (ATCC 29212)	CP-8027	Untinted, without Copper	3.56	N/A	N/A	5.9
		CP-8041	Untinted with Copper	0	3.56	5.9	
		CP-8029	PPG Raw Umber (Tint A) without Copper	3.54	N/A	N/A	
		CP-8043	PPG Raw Umber (Tint A) with Copper	0	3.54	5.9	
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	6.14	N/A	N/A	
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0	6.14	5.9	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 10a. Lot 1 – *Salmonella enterica* (ATCC 10708)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 1: 2-hour contact time, without Wear Cycles							
51433511	Salmonella enterica (ATCC 10708)	CP-8026	Untinted, without Copper	2.92	N/A	N/A	5.30
		CP-8040	Untinted with Copper	0.00	2.92	5.30	
		CP-8028	PPG Raw Umber (Tint A) without Copper	6.01	N/A	N/A	
		CP-8042	PPG Raw Umber (Tint A) with Copper	1.73	4.28	3.56	
		CP-8038	PPG Futurity Durable Red (Tint F) without Copper	1.67	N/A	N/A	
		CP-8052	PPG Futurity Durable Red (Tint F) with Copper	0.00	1.67	5.30	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 10b. Lot 2 – *Salmonella enterica* (ATCC 10708)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Uncoated Scrub Chart Log ₁₀ Recovery
				Average* Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)	
Lot 2: 2-hour contact time, without Wear Cycles							
51433511	Salmonella enterica (ATCC 10708)	CP-8027	Untinted, without Copper	5.09	N/A	N/A	4.99
		CP-8041	Untinted with Copper	0	5.09	4.99	
		CP-8029	PPG Raw Umber (Tint A) without Copper	5.94	N/A	N/A	
		CP-8043	PPG Raw Umber (Tint A) with Copper	0	5.94	4.99	
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	5.32	N/A	N/A	
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	0	5.32	4.99	

Average of 3 replicates coupons for each treatment.

*Log₁₀ Recovery from all coupons [w/o and w/Cu] after 2 hours of incubation.

Table 11a. Lot 1 – SARS-CoV-2, Isolate USA-WA1/2020 (Source: BEI Resources NR-52281)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 1: 2-hour contact time, without Wear Cycles								
51433512 (11/3/2020)	SARS-CoV-2, Isolate USA- WA1/2020 (Source: BEI Resources NR-52281)	CP-8027	Untinted, without Copper	< 2.58	N/A	> 3.08	5.67	5.83
		CP-8041	Untinted with Copper	< 1.50	≤ 1.08	> 4.17		
		CP-8029	PPG Raw Umber (Tint A) without Copper	< 2.50	N/A	> 3.17		
		CP-8043	PPG Raw Umber (Tint A) with Copper	< 1.50	≤ 1.00	> 4.17		
		CP-8031	PPG Formula Pro Durable Red (Tint B) without Copper	< 2.50	N/A	> 3.17		
		CP-8045	PPG Formula Pro Durable Red (Tint B) with Copper	< 1.50	≤ 1.00	> 4.17		
		CP-8035	PPG Raw Umber (Tint A) without Copper	< 2.50	N/A	> 3.17		
		CP-8049	PPG Raw Umber (Tint A) with Copper	< 1.50	≤ 1.00	> 4.17		
		CP-8039	PPG Futurity Durable Red (Tint F) without Copper	< 2.50	N/A	> 3.17		
		CP-8053	PPG Futurity Durable Red (Tint F) with Copper	< 1.50	≤ 1.00	> 4.17		

Average of 2 replicates for unexposed coupons and treated coupons.

Table 11b. Lot 2 – SARS-CoV-2, Isolate USA-WA1/2020 (Source: BEI Resources NR-52281)

MRID (Test Date)	Organism	Formulation ID Code	Tint and Treatment Description	Results			Scrub Chart Log ₁₀ Recovery	Population Control (TCID ₅₀ Log ₁₀ / carrier)
				Average Recovery (Log ₁₀ / carrier)	Log ₁₀ Reduction (Untreated, Unexposed comparison)	Log ₁₀ Reduction (Scrub Chart comparison)		
Lot 2: 1.5-hour contact time, without Wear Cycles								
51433512 (12/21/2020)	SARS-CoV-2, Isolate USA- WA1/2020 (Source: BEI Resources NR-52281)	CP-8133	Untinted without Copper	4.75	N/A	0.64	5.39	5.33
		CP-8135	Untinted with Copper	< 1.50	> 3.25	> 3.89		
		CP-8138	PPG Futurity Durable Red (Tint F) without Copper	4.33	N/A	1.06		
		CP-8139	PPG Futurity Durable Red (Tint F) with Copper	< 1.50	> 2.83	> 3.89		
		CP-8147	PPG Formula Pro Iron Oxide without Copper	4.50	N/A	0.89		
		CP-8122	PPG Formula Pro Iron Oxide with Copper	< 1.50	> 3.00	> 3.89		

Average of 2 replicates for unexposed coupons and treated coupons.

VI STUDY CONCLUSIONS

MRID	Claim	Surface Type	Application Method(s) and Dilution	Contact Time	Soil load	Diluent	Organism(s)	Data support tested conditions?
51433505	Supplemental antimicrobial residual copper paint, bacterial	Hard non-porous surface	Applied using the standard drawdown technique and allowed to dry for ≥ 24 hours; Ready-to-Use	2 hours	5% FBS + 1% Triton X-100	N/A	<ul style="list-style-type: none"> • <i>Staphylococcus aureus</i> (ATCC 6348) • <i>Pseudomonas aeruginosa</i> (ATCC 15442) 	Yes
51433506	Supplemental antimicrobial residual copper paint, viral	Hard non-porous surface	Applied using the standard drawdown technique and allowed to dry for ≥ 24 hours; Ready-to-Use	2 hours	5% FBS	N/A	<ul style="list-style-type: none"> • Feline calicivirus, Strain F-9 (ATCC VR-782) 	Yes
51433507, 51433508, 51433509, 51433510, 51433511	Supplemental antimicrobial residual copper paint, bacterial	Hard non-porous surface	Applied using the standard drawdown technique and allowed to dry for ≥ 24 hours; Ready-to-Use	2 hours	5% FBS	N/A	<ul style="list-style-type: none"> • <i>Klebsiella aerogenes</i> (ATCC 13048) • Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) (ATCC 3359) • <i>Escherichia coli</i> O157:H7 (ATCC 35150) • <i>Enterococcus faecium</i> (ATCC 29212) • <i>Salmonella enterica</i> (ATCC 10708) 	Yes
51433512	Supplemental antimicrobial residual copper paint, viral	Hard non-porous surface	Applied using the standard drawdown technique and allowed to dry for ≥ 24 hours; Ready-to-Use	1.5 - 2 hours	5% FBS	N/A	<ul style="list-style-type: none"> • SARS-CoV-2, Isolate USA-WA1/2020 (Source: BEI Resources NR-52281) 	Yes

VII LABEL COMMENTS

Label Date/Identification Number: No date provided; see label version under review attached.

1. The proposed label claims that the product, Copper Armor (Eggshell), EPA Reg. No. 56601-U, when applied as a ready-to-use architectural coating/ paint, in the following pigments:

PPG Raw Umber (Tint A)
PPG Formula Pro Durable Red (Tint B)
PPG Formula Pro Black (Tint C)
Sherwin Williams Black (Tint E)
PPG Futurity Durable Red (Tint F)

is an effective supplemental residual antimicrobial product against the following on hard, non-porous surfaces for a 2-hour contact time:

Staphylococcus aureus (ATCC 6348)
Pseudomonas aeruginosa (ATCC 15442)
Klebsiella aerogenes (ATCC 13048)
Methicillin-resistant *Staphylococcus aureus* (MRSA) (ATCC 3359)
Escherichia coli O157:H7 (ATCC 35150)
Enterococcus faecium (ATCC 29212)
Salmonella enterica (ATCC 10708)
Feline calicivirus, Strain F-9 (ATCC VR-782)
SARS-CoV-2, Isolate USA-WA1/2020 (Source: BEI Resources NR-52281)

These claims are **acceptable** as they are supported by the submitted data. It should be noted that the Certificates of Analysis (CoAs) for the post-test analysis of the test product samples indicate that PPG Futurity Durable Red (Tint F) with Copper was above the lower certified limit listed on the CSF for the subject product dated 6/16/2021. However, due to the collective data presented, the Agency will accept the aforementioned claims for this pigment. Note that this the only time the Agency will extend this provision and for any future data submissions, the Agency will only accept the chemical analysis of test lots performed prior to the initiation of testing.

2. Make the following changes to the proposed label:
 - a. Throughout the label, remove references to “protection” or “protected” as this may imply health protection, which is beyond the scope of the efficacy data. Alternatively, the applicant may use “additional barrier” or “provides continuous reduction”.
 - b. On page 3, remove “Wait at least 30 days after painting before cleaning the surface with a non-abrasive, mild cleanser”. Provide clarity to the end user for how surfaces should be treated during the first 30 days after painting. Specify what represents a “non-abrasive, mild cleanser” with the exact cleansers that should be used. In addition, the timeframe for when the end user can use these specific disinfectants tested and submitted to the Agency for review should be specified.

- c. On page 4, for claims 1-4, specify “on painted surfaces”.
- d. On page 5,
 - i. Remove “microbiocidal” or qualify to link to specific organism list as this is overly broad.
 - ii. Remove “Painted surfaces sanitize against” as this product does not meet EPA’s efficacy standards to qualify as a stand-alone disinfectant or sanitizer”.
 - iii. remove “Copper Armor can help to prevent diseases but is not a substitute for good hygiene control and should be used as one of the many ways to fight against diseases in the public domain.” Per Chapter 12 of the Agency’s Label Review Manual, disease prevention/control claims are under FDA jurisdiction.
- e. On page 6,
 - i. Remove “Helps protect against the spread of bacteria and viruses” and similar statements related to cross-contamination for consistency with the required label statements for copper-based products.
 - ii. revise “prevent the growth of bacteria and viruses” claims to “may reduce the growth of bacteria and viruses.”
 - iii. qualify “Painted surfaces kill 99.9% of bacteria and viruses”, “Painted surfaces kill bacteria and viruses”, and “Kills 99.9% of bacteria and viruses” with “within 2 hours of exposure when used as part of a comprehensive infection control program/protocol.”
- f. On pages 7-8, remove “power” claims as these imply enhanced efficacy per the Label Review Manual.

3. The Conditions of Registration should be included consistent with the protocol review.

The Conditions of Registration, as detailed below, are a requirement for registration to include determination of chemicals incompatible with surfaces from use:

Conditions of Registration

The following are a listing of Conditions of Registration required to support the proposed claims and use patterns:

Condition 1

The registrant will prepare and implement a stewardship program to support the responsible use of antimicrobial surface products. The Plan will be submitted for EPA review and approval within two months after the registration date. If EPA determines at any time after 18 months following registration that the Plan is not being adequately or timely implemented or that implementation of the Plan is not effectively ensuring the proper sale, distribution, or use of antimicrobial coated surfaces, the registration may be automatically canceled by the Agency by order with opportunity for a hearing but only after notification to the Registrant and an opportunity to meet with the Director of the Office of Pesticide Programs.

The Plan will include, at a minimum, the following elements:

- (a) Outreach to the infection control community, including,
 - (i) A goal of educating and reinforcing, for infection control professional and other product users, the proper use of the product.

(ii) Written (including electronic) communications directed to associations of infection control professionals, including at least the APIC, AHE, and any other relevant organizations identified by EPA, and State Departments of Health.

(iii) Outreach communications will be sent within six months after the date of registration and within one year after the date of registration, and then annually thereafter on the anniversary of the date of registration unless more frequent outreach is deemed necessary.

(iv) The content of the outreach communications will include statements explaining the registered claims and applications of antimicrobial coated surfaces, as well as their proper use. Additional content of outreach efforts will be developed as part of the Working Group activities.

(b) Development of Website

(i) The website will serve as a resource for conveying accurate information to the public about the efficacy and proper use of the product.

(ii) The website will include information on proper labeling and claims (including advertising); supporting science; applications; maintenance; and federal and state regulations and statutory requirements.

(iii) A question and answer of Frequently Asked Questions (FAQs) section will be incorporated to address common issues or questions raised with regard to the product.

(iv) The website also serves as a forum to correct any false or misleading third-party statements or publications, including scientific papers, concerning the product. Any such false or misleading third-party statements or publications will be corrected promptly after the registrant becomes aware of such and the responsive website update will be incorporated promptly thereafter. The registrant will inform EPA within 30 calendar days following its receipt of any such false or misleading third-party statements or publications and at the same time provide the Agency with a copy of such statement or publication along with a hard copy of the Website entry correcting such statement or publication.

(v) The registrant will arrange for and establish links between the website and the websites of appropriate infection control organization, including but not limited to APIC and ASHES.

(c) Establishment/Participation

(i) Invited participants will include manufacturers, component makers, and representatives from the infection control community, including appropriate trade associations (e.g. APIC and AHE) and State Departments of Health.

(ii) The Working Group will meet at least twice a year, either in person or by live video conferencing or teleconference.

(iii) The Working Group will serve as a forum to expand educational efforts, develop outreach communications, and address any questions or concerns from the public and infection control community.

(iv) The registrant will provide the Agency with minutes of any such meetings within 60 days of the end of any such meeting.

Condition 2

For at least the first 24 months after registration or until the Agency terminates this condition, whichever is later, the registrant will submit to EPA sample advertising materials. Advertising materials will be representative of advertisements intended for use in the marketplace.

Note to PM: The data submitted for the subject product do not substantiate fungicidal claims.